ABSTRACT

Delay domain multiplexing, differing from coherence multiplexing of digital data signals, may use orthogonal encoding to reduce cross-channel interference compared to traditional techniques. A plurality of photonic encoders may receive laser pulses from a laser pulse source, converting the pulses into n sets of orthogonal codes, such as Walsh codes, depending on the number of channels to be multiplexed. A passive apparatus may use orthogonal codes, creating them fast enough to function in an optical or photonic environment. The orthogonal codes may subsequently be modulated with n digital data signals before being multiplexed and demultiplexed in a delay domain or coherence multiplexing apparatus. At a receiver, the encoded signals are decoded and the original digital data signals are extracted therefrom.